PUBLISHED

UNITED STATES COURT OF APPEALS
FOR THE FOURTH CIRCUIT

No. 18-2090

DEFENDERS OF WILDLIFE; SIERRA CLUB; VIRGINIA WILDERNESS COMMITTEE,

Petitioners,

v.

UNITED STATES DEPARTMENT OF THE INTERIOR; UNITED STATES FISH AND WILDLIFE SERVICE, an agency of the U.S. Department of the Interior; JIM KURTH, in his official capacity as Acting Director; PAUL PHIFER, in his official capacity as Assistant Regional Director, Ecological Services, Responsible Official,

Respondents,

ATLANTIC COAST PIPELINE LLC,

Intervenor.

On Petition for Review of the United States Fish and Wildlife Service's Biological Opinion and Incidental Take Statement. (CP15–554–000; CP15–554–001; CP15–555–000)

Argued: May 9, 2019 Decided: July 26, 2019

Before GREGORY, Chief Judge, WYNN, and THACKER, Circuit Judges.

Vacated and remanded by published opinion. Chief Judge Gregory wrote the opinion, in which Judge Wynn and Judge Thacker joined.

ARGUED: Austin Donald Gerken, Jr., SOUTHERN ENVIRONMENTAL LAW CENTER, Asheville, North Carolina, for Petitioners. Kevin William McArdle,

UNITED STATES DEPARTMENT OF JUSTICE, Washington, D.C., for Respondents. Brooks Meredith Smith, TROUTMAN SANDERS, LLP, Richmond, Virginia, for Intervenor. **ON BRIEF:** Amelia Burnette, J. Patrick Hunter, Asheville, North Carolina, Gregory Buppert, SOUTHERN ENVIRONMENTAL LAW CENTER, Charlottesville, Virginia, for Petitioners. Eric Grant, Deputy Assistant Attorney General, Andrew C. Mergen, Avi Kupfer, Environment and Natural Resources Division, UNITED STATES DEPARTMENT OF JUSTICE, Washington, D.C.; Tony Sullins, S. Amanda Bossie, Office of the Solicitor, UNITED STATES DEPARTMENT OF THE INTERIOR, Washington, D.C., for Federal Respondents. Andrea W. Wortzel, TROUTMAN SANDERS LLP, Richmond, Virginia, for Intervenor.

GREGORY, Chief Judge:

In 2017, the U.S. Fish and Wildlife Service ("FWS") issued a Biological Opinion in connection with the proposed Atlantic Coast Pipeline, which will transport natural gas from West Virginia to Virginia and North Carolina. That Opinion, required by the Endangered Species Act, concluded that the proposed pipeline will not jeopardize the continued existence of several endangered and threatened species that are likely to be impacted by pipeline construction. As relevant here, the Biological Opinion concluded that the pipeline will not jeopardize four species: the rusty patched bumble bee, clubshell, Indiana bat, or Madison Cave isopod. However, because FWS anticipated the incidental taking, *i.e.*, harassing or killing, of those species, the agency issued an Incidental Take Statement with its Biological Opinion, setting limits on the number of each species that the pipeline could legally take.

Petitioners challenged the take limits imposed by the 2017 Incidental Take Statement. After reviewing that agency action, we determined that FWS's take limits were arbitrary and capricious. Accordingly, we vacated the Incidental Take Statement.

Shortly after our decision, FWS issued a new Biological Opinion and Incidental Take Statement. Petitioners now challenge the findings of both of those agency actions. Specifically, Petitioners assert that FWS improperly determined that pipeline construction will not jeopardize the rusty patched bumble bee or the clubshell, and they challenge the validity of the take limits imposed for the Indiana bat and the Madison Cave isopod. Because we find that FWS arbitrarily reached its no-jeopardy conclusions and failed to

correct the deficiencies in the take limits that we identified in the previous appeal, we grant the petition and vacate the 2018 Biological Opinion and Incidental Take Statement.

I.

Before we turn to the relevant facts of this case, we review the statutory context in which this appeal arises. The Endangered Species Act ("ESA") was enacted "to protect and conserve endangered and threatened species and their habitats." *Sierra Club v. U.S. Dep't of the Interior*, 899 F.3d 260, 268 (4th Cir. 2018) (quoting *Nat'l Ass'n of Home Builders v. Defs. of Wildlife*, 551 U.S. 644, 651 (2007)). In line with that purpose, the ESA prohibits federal agencies from engaging in any action "likely to jeopardize the continued existence of any endangered species or threatened species." 16 U.S.C. § 1536(a)(2). The Act also prohibits the "take" of endangered and threatened species, *i.e.*, the harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, collecting of a listed species, or any "attempt to engage in such conduct." *Id.* §§ 1532(19), 1538(a)(1)(B). A person harms or harasses a listed species when she disrupts that species's "normal behavioral patterns" or causes indirect injury by "habitat modification." *Sierra Club*, 899 F.3d at 269; 50 C.F.R. § 17.3.

"Any person who knowingly takes an endangered or threatened species is subject to substantial civil and criminal penalties, including imprisonment." *Sierra Club*, 899 F.3d at 269 (internal quotation marks omitted) (quoting *Bennett v. Spear*, 520 U.S. 154, 170 (1997)); *see* 16 U.S.C. § 1540(a), (b). But a person may escape liability for taking a listed

species when "such taking is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity." 16 U.S.C. § 1539(a)(1)(B).

To comply with the ESA, federal agencies faced with permit applications for construction projects must ensure, in consultation with the U.S. Fish and Wildlife Service ("FWS"), that "any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence of" a listed species or "result in the destruction or adverse modification" of designated critical habitat. 16 U.S.C. § 1536(a)(2). Formal consultation with FWS is required when an agency proposing to act ("action agency") determines that its action "may affect" a listed species or critical habitat. 50 C.F.R. § 402.14(a).

When consultation has concluded, FWS issues a Biological Opinion ("BiOp") addressing whether the proposed action "is likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of critical habitat." *Id.* § 402.14(g)(4), (h)(3). A proposed action jeopardizes the continued existence of a species when it "reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species." *Id.* § 402.02. And a proposed action destroys or adversely modifies a species's critical habitat when it directly or indirectly alters it in a way that "appreciably diminishes the value of critical habitat for the conservation of a listed species." *Id.*

If FWS concludes that a proposed project is not likely to jeopardize the continued existence of a listed species but will result in the take of some members of that species, the

consulting party may lawfully take those members only if it first obtains a valid Incidental Take Statement ("ITS") from FWS setting enforceable limits on the quantity that may be taken. 16 U.S.C. § 1536(b)(4); 50 C.F.R. § 402.14(g)(7), (i). Both the BiOp and ITS are formulated during the formal consultation process with FWS, and the ITS is issued with, and supplements, the BiOp. *See* 50 C.F.R. § 402.14(g), (i)(1); *Or. Nat. Res. Council v. Allen*, 476 F.3d 1031, 1036 (9th Cir. 2007).

With this framework in mind, we turn to the facts underlying this appeal.

II.

The Atlantic Coast Pipeline ("ACP") is a proposed 600-mile pipeline designed to transport natural gas from West Virginia to Virginia and North Carolina. J.A. 816. Construction of the pipeline will require a 125-foot right-of-way that will disturb 11,776 acres of land. Construction will also require additional temporary workspace and the use of access roads. To secure these spaces, and during construction itself, certain forested areas will need to be cleared of trees, ground will be displaced, and sediment will be deposited into river waters.

In 2015, Intervenor Atlantic Coast Pipeline, LLC ("Atlantic") applied to the Federal Energy Regulatory Commission ("FERC") for a certificate of public convenience and necessity for the ACP. That certificate, required under the Natural Gas Act, serves as the grant of final approval to construct the pipeline. 15 U.S.C. § 717f. The Natural Gas Act also requires Atlantic to obtain "any permits, special use authorizations, certifications, opinions, or other approvals as may be required under Federal law." *N.Y. Dep't of Envtl.*

Conservation v. FERC, 884 F.3d 450, 452–53 (2d Cir. 2018) (quoting 15 U.S.C. § 717n(a)(1), (2)). As the lead agency, FERC is responsible for coordinating all applicable federal authorizations. 15 U.S.C. § 717n(b)(1).

After Atlantic submitted its application to FERC, it was determined that pipeline construction may affect several threatened or endangered species. Therefore, FERC initiated formal consultation with FWS to determine whether the pipeline would likely jeopardize the continued existence of those species. *See* 50 C.F.R. § 402.14(a).

On October 13, 2017, FERC issued a certificate of public convenience and necessity for the ACP. FERC conditioned its approval of the pipeline on Atlantic's receipt of all state and other federal authorizations required for the project, including the pending authorization from FWS.

On October 16, 2017, FWS issued a BiOp, concluding that the ACP is not likely to jeopardize the existence of any of the affected listed species. FWS also issued an ITS because it determined that pipeline construction was likely to result in the take of members of six of those species. The ITS did not set numeric take amounts for five of the species to be taken. Instead, it relied on habitat surrogates, setting take limits such as "small percent of," "majority," and "all." J.A. 871–74.

In January 2018, Petitioners sought review of the ITS. *Sierra Club v. U.S. Dep't of the Interior*, 899 F.3d 260 (4th Cir. 2018). They challenged only the habitat surrogates used by FWS. *Id.* at 270. Petitioners did not challenge the BiOp's determination that ACP construction will not jeopardize the listed species. *Id.* at 266, 270.

In May 2018, we vacated the ITS. *Sierra Club v. U.S. Dep't of the Interior*, 722 F. App'x 321, 322 (4th Cir. 2018). As we later explained in our August 6, 2018, opinion, FWS had failed to create proper habitat surrogates, failed to explain why numeric take limits were not practical, and failed to create enforceable take limits for the clubshell (a mussel), rusty patched bumble bee, Madison Cave isopod (a crustacean), Indiana bat, and northern long-eared bat. *Sierra Club*, 899 F.3d at 275–81.

On August 23, 2018, FERC reinitiated formal consultation with FWS to correct the ITS and because of "new information . . . for some of the species." J.A. 1101. Less than three weeks later, on September 11, 2018, FWS issued a new BiOp and ITS. As relevant here, the 2018 BiOp concluded that the ACP will not jeopardize the survival and recovery of the rusty patched bumble bee ("RPBB"), clubshell, Indiana bat ("Ibat"), or the Madison Cave isopod ("MCI"). The ITS set take limits for each of these species.

Petitioners now challenge the BiOp's conclusion that the ACP will not jeopardize the RPBB or the clubshell. Petitioners also challenge the take limits imposed for the Ibat and MCI. We stayed the 2018 BiOp and ITS pending our review of this petition.

We have jurisdiction under the Natural Gas Act. 15 U.S.C. § 717r(d)(1).

III.

We review the 2018 BiOp and ITS under the default standard of the Administrative Procedure Act ("APA") and ask whether the challenged actions are "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." *Alaska Dep't of Envtl. Conservation v. EPA*, 540 U.S. 461, 496–97 (2004) (quoting 5 U.S.C. § 706(2)(A)); *see*

also Friends of Back Bay v. U.S. Army Corps of Eng'rs, 681 F.3d 581, 586–87 (4th Cir. 2012). Agency action is arbitrary and capricious "if the agency relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise." *Defs. of Wildlife v. N.C. Dep't of Transp.*, 762 F.3d 374, 396 (4th Cir. 2014) (quoting *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins.*, 463 U.S. 29, 43 (1983)). In short, "we must ensure that the agency has examined the relevant data and articulated a satisfactory explanation for its action." *Id.* (internal quotation marks and brackets omitted) (quoting *FCC v. Fox Television Stations, Inc.*, 556 U.S. 502, 513 (2009)). "Review under this standard is highly deferential, with a presumption in favor of finding the agency action valid." *Ohio Valley Envtl. Coal. v. Aracoma Coal Co.*, 556 F.3d 177, 192 (4th Cir. 2009). But we will vacate agency action if it is not "based on a consideration of the relevant factors" or where "there has been a clear error of judgment." *Marsh v. Or. Nat. Res. Council*, 490 U.S. 360, 378 (1989) (citation omitted).

IV.

In preparing its BiOp, FWS was required to use "the best scientific and commercial data available." 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.14(g)(8). FWS's "failure to do so violates the APA." *San Luis & Delta-Mendoza Water Auth. v. Locke*, 776 F.3d 971, 995 (9th Cir. 2014). The purpose of the best-available-data standard is to ensure that FWS does not act based on "speculation and surmise." *Id.* (citing *Bennett v. Spear*, 520 U.S. 154, 176

(1997)). Under this standard, FWS may decide which data and studies are the best available, and its decision is reviewed under a deferential standard. *Miccosukee Tribe of Indians of Fla. v. United States*, 566 F.3d 1257, 1265 (11th Cir. 2009). The agency is not required to conduct new studies when evidence is available upon which a determination can properly be made. *Sw. Ctr. for Biological Diversity v. Babbitt*, 215 F.3d 58, 60 (D.C. Cir. 2000).

This does not mean, however, that FWS is barred from requesting new studies when available data is inadequate to prepare a BiOp and render a jeopardy determination. On the contrary, FWS regulations for the ESA provide that "[t]he federal agency requesting formal consultation"—in this case FERC—"shall provide [FWS] with the best scientific and commercial data available *or which can be obtained during the consultation* for an adequate review of the effects that an action may have upon listed species or critical habitat." 50 C.F.R. § 402.14(d) (emphasis added). And the regulations further provide that "[w]hen [FWS] determines that additional data would provide a better information base from which to formulate a biological opinion, the Director may request an extension of formal consultation and request that the Federal Agency"—again, FERC in this case—"obtain additional data to determine how or to what extent the action may affect listed species or critical habitat." *Id.* § 402.14(f). Accordingly, federal law expressly authorizes FWS to request new survey data from a consulting agency if the existing data is not "adequate" to determine the effect of the project.

The best-available-data standard also means that FWS is not free to disregard other "available biological information" that "is in some way better than the evidence [it] relies

on." *Kern Cty. Farm Bureau v. Allen*, 450 F.3d 1072, 1080–81 (9th Cir. 2006) (alteration in original) (citations omitted). Rather, FWS must seek out and consider all existing scientific data relevant to the decision it is tasked with making. *Heartwood, Inc. v. U.S. Forest Serv.*, 380 F.3d 428, 436 (8th Cir. 2004).

After reviewing the agency's 2018 BiOp and ITS, we agree with Petitioners that FWS has again acted arbitrarily. We address in detail the agency's decisions with respect to each listed species in turn.

A. Rusty Patched Bumble Bee

In their previous appeal, Petitioners challenged the take limits imposed by FWS on the RPBB. We found that those limits violated the Endangered Species Act. *Sierra Club*, 899 F.3d at 277. Now, Petitioners challenge the agency's finding in the BiOp that the ACP will not jeopardize the RPBB in the first instance.

Some background on the RPBB and the model used by FWS in assessing impacts on the species is helpful here. The RPBB is a colonial bee species with an annual cycle. That cycle begins in early spring, when nests or colonies are started by solitary queen bees. Those nests, although occasionally observed above ground, typically are located underground, in abandoned rodent nests or other similar cavities. Throughout the summer, the foundress queen bees produce worker bees. Worker bees are responsible for foraging for food for the colony. The health of the colony depends on the number of workers foraging and the abundance of foraging habitat. RPBB colony sizes are larger than those of other bumble bees, and a healthy colony is composed of up to 1,000 worker bees in a season. *Endangered and Threatened Wildlife and Plants; Endangered Species Status for*

Rusty Patched Bumble Bee, 82 Fed. Reg. 3186, 3187 (Jan. 11, 2017). In late summer and early fall, the queen bee produces male drones and new queens. At the end of the cycle, male drones and the new queens mate, while the foundress queen and workers die. The new queens then overwinter, or hibernate. Overwintering occurs underground, primarily in soft-soil and leaf-litter chambers that the queens form in forested areas. After overwintering, these queens emerge in the spring, and the cycle begins again.

Historically, the RPBB was "abundant and widespread, with hundreds of populations across an expansive range." 82 Fed. Reg. at 3188. Since the late 1990s, however, RPBB populations have plummeted by nearly 90 percent. When the species was listed as endangered in January 2017, 95% of the 103 known populations had been documented by 5 or fewer bees. *Id.* at 3205. As FWS has recognized, the RPBB "is so imperiled that every remaining population is important for the continued existence of the species." J.A. 941. Without affirmative protection, all but one RPBB ecoregion are predicted to be extinct within 5 years, and that one remaining ecoregion would cease to exist within 30 years.

One contributing factor to the RPBB's swift decline is that RPBBs suffer, as do other bee colonies, from a phenomenon known as the diploid male vortex. This phenomenon occurs when related bees mate, leading to a higher chance of haplodiploidy—a condition where 50% of the haploid worker bees are replaced by diploid males that do not contribute food resources to the colony. This, in turn, leads to a higher likelihood of colony collapse. Many RPBB populations are victimized by other stressors as well, including pathogens, pesticides, habitat loss and degradation, and climate change.

Concurrent with its preparation of the BiOp for the ACP project, FWS developed guidelines for federal projects that may affect the RPBB's continued existence. J.A. 514; J.A. 1110. Under those guidelines, FWS uses a model to identify areas that are likely to be populated by RPBBs, areas referred to as "high potential zones." J.A. 517–18. The boundaries of those high potential zones are delineated using extant populations data (species observation data that is less than 10 years old), estimated foraging and dispersal distances of the bees, and surrounding vegetation types. While the species may be present elsewhere, the modeled high potential zones are thought to "provide a reasonable basis for describing where the species is likely to be present and where federal agencies should consult with [ ] FWS to evaluate the potential effects of their actions." J.A. 518. If a project area overlaps with a habitat suitable to RPBBs in a high potential zone, the consulting agency has two options to determine actual bee presence: it may survey the area of overlap to verify the presence of RPBBs or it may choose to forgo a survey, in which case RPBB presence is assumed and consultation with FWS is required. J.A. 521.

In its 2017 BiOp, FWS concluded that a 653-hectare high potential zone for the RPBB existed in Bath County, Virginia. This zone was calculated based on the sighting of one worker bee foraging in the George Washington National Forest along a pipeline access road. While FWS could not determine where the nest for the worker bee's colony was located and did not survey for that colony, it calculated the high potential zone based on average foraging distances of RPBB workers and the location of habitat suitable for nesting and overwintering queens. The 2017 BiOp acknowledged that "there is uncertainty regarding habitat use and distribution of the species during certain life stages and time

periods." J.A. 840. The BiOp also explained that the "[s]tatus of colony and population in the [high potential zone] is unknown at this time because while the presence of a worker bee signifies the existence of a colony, [the agency had] no accurate way to assess the status of the local population." *Id.* Accordingly, in determining RPBB "distribution and habitat use," FWS relied on various "assumptions, based on the best available information." *Id.* One of those assumptions was that "RPBB activity (foraging, nesting, overwintering queens) [was] concentrated in the [high potential zone]." *Id.* Other assumptions related to the density of the RPBB population in Bath County. For example, FWS assumed that the one observed worker bee was part of a colony composed of 100 to 1,000 worker bees that produced 6 to 8 new foundress queens each cycle. FWS also assumed that the density of RPBB colonies in the high potential zone was 14 nests per 100 hectares, an estimate that was calculated by using the nesting density of the "common and abundant" buff-tailed bumble bee. *Id.*

In July and August 2018, FWS received information from the Virginia Department of Conservation and Recreation ("DCR") that 22 RPBBs—9 in Bath County and 13 in Highland County—had been observed during 2018 bee surveys that the state agency had conducted. The 2018 sightings were closer to the pipeline right-of-way than the lone 2017 sighting had been and were near 3 project access roads rather than just one.

Based on this new information, FWS expanded the Bath County high potential zone from 653 hectares to 969.6 hectares. The newly drawn high potential zone was based on the 2017 and 2018 bee sightings and the RPBB's "potential ability to disperse across the landscape." J.A. 1183. Just as FWS had assumed in the 2017 BiOp that the RPBB was

likely to occur in the 653-hectare high potential zone, the agency now assumed that RPBB activity is concentrated within the expanded 969.6-hectare high potential zone. FWS assumed that the high potential zone contains 156.3 hectares of nesting and foraging habitat and 900.7 hectares of overwintering habitat. Based on these assumptions, FWS determined that the ACP action area overlaps with the newly drawn high potential zone and encompasses 6.29 hectares of nesting and foraging habitat and 10.27 hectares of overwintering habitat. The 2018 BiOp also relied on the same nest density as the 2017 BiOp—14 nests per 100 hectares.

Evaluating the effects of pipeline construction in the newly drawn high potential zone, the 2018 BiOp determined that construction will likely cause the crushing of 8 overwintering queens, the crushing of worker bees, and will impact one RPBB colony capable of producing 30 overwintering queens. These estimates were based on FWS's assumption that 22 RPBB nests are located in the high potential zone[1] and that each nest produces 30 overwintering queens, resulting in a total of 660 overwintering queens each cycle in the high potential zone—a number of queens that far exceeds the 6-8 queen-per-colony estimate of the 2017 BiOp and that exceeds the total number of RPBBs that have been documented in current populations worldwide.[2] Explaining that a "healthy" bee

[1] This assumption is based on a nest density of 0.14 nests per hectare within the total assumed nesting habitat of 156.3 hectares.

[2] As noted earlier, 95% of the 103 remaining populations of RPBB (or 98 populations) have been observed with 5 or fewer bees. One of the other 5 populations was documented by 30 bees—the maximum number observed in any of the remaining (Continued)

population typically contains tens to hundreds of colonies and that the loss of a single colony or overwintering queen "could reduce the health of a metapopulation[3] due to lost opportunities to interbreed," J.A. 1216, FWS nonetheless concluded that the destruction of 1 of the 22 colonies in the high potential zone, with the potential to produce 30 foundress queens, and the loss of 8 overwintering queens were "not likely to negatively impact the fitness or survival of the population," J.A. 1217. Accordingly, FWS found that the ACP would not jeopardize the RPBB.

In challenging this no-jeopardy finding, Petitioners advance several arguments that we find persuasive. We address each in turn.

1. Nest Density

We first find that the 2018 BiOp's nest density calculation—a calculation that FWS used to determine the total number of RPBBs likely to be impacted by pipeline construction—is arbitrary because it is not based on the best available information and in fact ignores evidence that the agency itself has developed.

Underlying the arbitrary nature of the 2018 BiOp's nest density calculations is the fact that "[t]here are no studies that estimate RPBB nest density." J.A. 1185. Although FWS has developed guidance for surveying the RPBB, it has conducted no surveys to estimate RPBB nest density. In fact, the agency made a point of avoiding surveys in order

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populations. Thus, assuming that the other 4 populations were documented with at most 29 bees each, the total number of observed RPBBs worldwide would be at most 636.

[3] A "metapopulation" is "an assemblage of interacting subpopulations." J.A. 407. A subpopulation is composed of many bee colonies, each of which represents one reproductive unit. *Id.*

to "fast-track" pipeline authorization. *See* J.A. 567 ("Our internal direction is that we can't require surveys and will not make further requests for surveys that interfere with applicant's project schedule since these are priority fast-track projects, and we will not state that we have insufficient information to initiate consultation and will not delay initiation of consultation based on lack of baseline/species survey data."). And while the Virginia DCR observed RPBBs in its 2018 bee survey, that survey was unrelated to the ACP project and was not designed specifically to document RPBB populations or to calculate nest density of the species.

Without survey data, FWS relied on several assumptions and on the known nest densities of other bumble bees to estimate the number of RPBBs likely to be present in the action area and thus impacted by the ACP. The agency reviewed 11 studies of nest density for 7 other bumble bee species and ultimately based its RPBB nest density calculations on the nest densities of 2 other species: the buff-tailed bumble bee and the great yellow bumble bee. Because FWS did not "develop[ ] additional data," *Sierra Club*, 899 F.3d at 273, we must determine whether the available evidence of other species' nest densities is a sufficient basis for FWS's determinations here such that FWS was not required to ask FERC to conduct additional surveys. *See Sw. Ctr. for Biological Diversity*, 215 F.3d at 60.[4]

[4] As we explained in our prior decision in this case, the ESA "does not foreclose FWS or an applicant from developing additional data." *Sierra Club*, 899 F.3d at 273; *see Or. Nat. Res. Council*, 476 F.3d at 1038 (vacating ITS where BiOp noted that species survey data was out-of-date and that surveys had been discontinued and where agency never stated that it was not possible to update survey data to estimate number of takings). (Continued)

We cannot conclude from the 2018 BiOp that FWS's reliance on either of the two other species' data is anything more than arbitrary and capricious. The nest density for the buff-tailed bumble bee—which, unlike the RPBB, is a "common and abundant" species—varies from 0.04 nests/hectare ("ha") to 0.88 nests/ha, with a mean density of 0.34 nests/ha. J.A. 1185. FWS determined that 0.14 nests/ha would be a reasonable estimate for the RPBB because "densities of 0.04 to 0.15 nests/ha for the buff-tailed bumblebee represented 40 percent of the estimates in [buff-tailed bee] studies and the buff-tailed bumblebee is common and abundant compared to the relatively rare RPBB." *Id.* While FWS acknowledged that applying the mean density of the buff-tailed bumble bee "would likely be an overestimate of the density of RPBB nests," it did not explain why it chose the higher end of the 0.04 to 0.15 nests/ha range as the appropriate estimate. *Id.* Rather, the agency appears to have randomly picked that number out of a hat.

FWS also determined that a density of 0.14 nests/ha was a reasonable estimate because the nest density for the great yellow bumble bee—which has undergone a "precipitous decline" and nests in habitats similar to those of the RPBB—is 0.19 nests/ha. J.A. 1185–86. The study of the great yellow bumble bee on which the BiOp relied included a "caveat" that the researchers "concentrated on sites known to hold [great yellow bumble

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The 2018 BiOp states that, because suitable foraging habitat changes locations from one year to another and bee numbers "fluctuate throughout the season," it is likely not possible to conduct surveys to determine RPBB nest density. J.A. 1185. However, in the same breath, FWS likens the nest density of the RPBB to the known nest densities of 2 other bumble bees, after studying nest densities of 7 other bees. J.A. 1185–86. It is unclear why the nest densities of those bees—whose numbers likely also fluctuate throughout the season and whose foraging habitats also change—can be studied, but those of the RPBB cannot. And among the objectives of FWS's survey protocols for the RPBB is the monitoring of RPBB populations to determine "relative abundance and species richness." J.A. 1185.

bees] in some numbers" and warned that the study's "conclusions may not extend to other, smaller and more peripheral populations." J.A. 175. Given that caveat, and the likely "smaller and more peripheral" RPBB population at issue, FWS does not explain why that study is nonetheless a reliable comparator, other than the fact that the great yellow bumble bee is also in decline. Moreover, FWS fails to explain why it chose to use the specific figure of 0.14 nests/ha as opposed to a density closer to that of the great yellow bumble bee. Again, the nest density chosen by the agency appears to have been selected at random.

The arbitrariness of the nest density figure is further highlighted by other evidence available to FWS, evidence which the 2018 BiOp fails to consider in estimating RPBB presence in the pipeline action area. In its 2017 regulations adding the RPBB to the list of endangered species, FWS explained:

> Since the late 1990s, rusty patched bumble bee abundance and distribution has declined significantly. Historically, the rusty patched bumble bee has been documented from 926 populations; since 1999, the species has been observed at 103 populations, which represents an 88 percent decline from the number of populations documented prior to 2000. We assumed any population with at least one record (one individual rusty patched bumble bee seen) since 1999 is current, and thus, the overall health and status of these 103 current populations is uncertain. Indeed, *many populations have not been reconfirmed since the early 2000s and may no longer persist*. For example, no rusty patched bumble bees were observed at 41 (40 percent) of the current sites since 2010 and at 75 (73 percent) of the 103 sites since 2015. Furthermore, many of the current populations are documented by only a few individuals; *95 percent of the populations are documented by 5 or fewer individuals; the maximum number found at any site was 30*. The number of individuals constituting a healthy colony is typically several hundred, and a healthy population typically contains tens to hundreds of colonies.

82 Fed. Reg. at 3188 (emphases added). Although nearly all of the currently known RPBB populations have been documented by at most 5 bees, FWS determined that the RPBB population in the high potential zone here includes 22 nests capable of producing 30 queen bees each, for a total of 660 queens produced each cycle. J.A. 1215. The number of queens per nest that FWS estimates is equal to the maximum number of *total* bees observed at any one colony and does not include an estimate of the number of worker bees believed to be present, which would no doubt be much higher than 30 per nest. The BiOp is silent on why these projections are reasonable in light of the known and documented record of severely declining RPBB populations.

The reasonableness of the 30-queens-per-nest figure also fails to find support in studies of other species' queen production rates cited by FWS. The 2018 BiOp cites to FWS's August 2018 draft Voluntary Implementation Guidance for the RPBB as support for its 30-queens-per-nest estimate. J.A. 1184–85, 1253. That draft guidance explains that two studies of two colonies of common and abundant buff-tailed bumble bees reared in nest boxes (not in the wild) showed a production average of 14 and 31 queens, respectively. J.A. 1127. In discussing those studies, the draft guidance notes that FWS "would expect nests in natural settings to produce fewer queens on average due to the increase in hazards relative to nest boxes." *Id.* Therefore, bees like the RPBB in the high potential zone would be expected to produce fewer queens than RPBBs that were raised in nest boxes, free from many of the perils found in nature. And because the RPBB is much less abundant than the buff-tailed bumble bee, it would be logical to expect that RPBB queen production rates would also be lower than those of the bees' buff-tailed cousins. Nonetheless, FWS

concluded that RPBBs, which are in significant decline, produce an average of 30 queens per nest in natural habitats, "similar to the *higher* of the two buff-tailed bumble bee studies." J.A. 1127 (emphasis added).

The draft guidance also relies on a density range of 20 to 40 queens per nest, an estimate provided to FWS by Dr. Elaine Evans of the University of Minnesota. *Id.* However, in an email to FWS explaining the basis for that range, Dr. Evans stated, "*All I have is a wild guess* based on what I've seen in other captive and retrieved wild colonies. Range would be 0 - ~ 100. *My guess* for an average per colony ignoring the ones that don't produce queens would be 20-40." J.A. 929 (emphases added).

FWS's sole explanation in its draft guidance for its use of the 30-queens-per-nest figure is that it is the midpoint of the range "guess[ed]" by Dr. Evans and similar to the higher of the two buff-tailed bumble bee studies. J.A. 1127; *see* J.A. 929. FWS fails to explain why this evidence is the best available when all other evidence shows that the RPBB is in substantial decline and should *not* be compared to a common and abundant bee species—much less to the *higher* production rate of that species. And an expert's "wild guess" inspires no additional confidence in the reasonableness of FWS's estimate. *See Ctr. for Biological Diversity v. Bureau of Land Mgmt.*, 422 F. Supp. 2d 1115, 1127 (N.D. Cal. 2006) ("To the extent that there is any uncertainty as to what constitutes the best available scientific information, Congress intended 'to give the benefit of the doubt to the species.'" (quoting *Conner v. Burford*, 848 F.2d 1441, 1454 (9th Cir. 1988))).

At bottom, FWS has arbitrarily estimated the number of RPBB nests and bees present in the high potential zone. The agency has failed to connect the dots between the

studies of other bee species on which it relies and the likely nest density and queen production rate of the RPBB. The agency has also ignored significant evidence that undermines the reasonableness of its estimates—evidence that the agency itself has gathered—and has instead chosen to rely on one bee expert's "wild guess." We agree with Petitioners that these arbitrary calculations demonstrate the overall arbitrariness of FWS's no-jeopardy finding with respect to the RPBB. *See Dow AgroSciences LLC v. Nat'l Marine Fisheries Serv.*, 707 F.3d 462, 473 (4th Cir. 2013) (explaining that, where agency's data is "either outdated or inaccurate," agency should, at the very least, explain why it nonetheless relied on the data on which it did); *Defs. of Wildlife*, 762 F.3d at 396 (stating that agency action is arbitrary and capricious if the agency "offered an explanation for its decision that runs counter to the evidence before the agency").

2. Inconsistencies in FWS's Evidence

Petitioners also argue that the 2018 BiOp's conclusion that the ACP will not jeopardize the RPBB is arbitrary because it is at odds with FWS's own evidence of the importance to RPBB survival of the bees likely to be killed by pipeline construction. We agree.

According to the 2018 BiOp, ACP construction will impact RPBBs in two ways. First, it will indirectly reduce reproductive success because it will remove foraging resources that support queens and will crush worker bees. Second, it will directly impact colony reproduction by crushing 8 overwintering queens and by impacting one colony, thereby preventing another 30 foundress queens from being produced. *See* J.A. 1282 (describing impacts of ACP construction as crushing individual RPBBs, queens, or

colonies; displacing worker bees, which could affect their ability to provide sufficient food resources to colony; and affecting the "quality, quantity, and timing of floral resources, thereby reducing survivability and reproductive success of queens").

As we just explained, the 2018 BiOp's estimate of the number of RPBBs likely to exist in the high potential zone is arbitrary. Even assuming that estimate to be proper, the BiOp's conclusion that ACP's effects on the Bath County bee population do not jeopardize the species is nonetheless arbitrary. Lost opportunities to interbreed enhance the effect of the diploid male vortex, thereby leading to further population size decrease or even the loss of the population. *See* J.A. 1216 ("[A]s population size decreases, population growth rate also tends to decrease and the risk of local extirpation increases."). As FWS recognizes, "[l]oss of a colony or overwintering queen could reduce the health of a metapopulation due to lost opportunities to interbreed." J.A. 1216. In fact, FWS has recognized that the RPBB is "so imperiled that every remaining population is important" for the species' continued survival. J.A. 941; Resp. Br. 12.

Yet, FWS concluded that the loss of not one but potentially 38 foundress queens is "not likely to negatively impact the fitness or survival of the population"—and consequently of the species—because FWS assumes that the remaining 21 colonies believed to be in the high potential zone will not be significantly impacted by the ACP. J.A. 1216–17. That is, FWS determined that the killing of more bees than have been found in most locations in the past two decades would not jeopardize the continued survival or recovery of the RPBB.

The 2018 BiOp fails to square this determination with FWS's other evidence that 95% of the documented RPBB populations have been observed with 5 or fewer bees. 82 Fed. Reg. at 3205. While the death of a handful of bees may not be as significant to a healthy bee population with tens to hundreds of thousands of bees, record evidence indicates that the RPBB population at issue is far from healthy. The 2018 BiOp fails to explain why it is that the loss of 38 potential queens does not endanger the survival of the Bath County RPBB population when the loss of "*a* colony or overwintering queen could reduce the health of a *metapopulation*." J.A. 1216. Absent a reasoned discussion of the agency's apparently contradictory positions about the species, we can only conclude that FWS acted arbitrarily in determining that the likely impacts of the ACP on the RPBB will not jeopardize the species' continued existence and recovery. *Defs. of Wildlife*, 762 F.3d at 396.

3. Status of the Species

Petitioners also argue that the 2018 BiOp fails to account for the overall status of the RPBB. In light of the precarious status of the species, we again agree with Petitioners.

FWS's Endangered Species Act Handbook instructs that the agency's jeopardy conclusion should be made upon "reviewing the current status of" the species, in addition to the effects of the proposed action. J.A. 78; *see Ctr. for Biological Diversity v. Salazar*, 695 F.3d 893, 913 (9th Cir. 2012) (explaining that a BiOp must address whether the proposed action is likely to jeopardize the continued existence of the listed species "as a whole"). Here, the 2018 BiOp addresses the status of the RPBB in a short, four-sentence paragraph:

> As described in Service (2016), the RPBB conservation needs include assessing resiliency to environmental variation, perturbations affecting habitat size and quality, and population size. Currently, the rangewide status of the species is declining (82 FR 3186-3209). The primary factors influencing the status include risks posed by "pathogens, pesticides, habitat loss and degradation, small population dynamics, and climate change" (82 FR 3186-3209). For a more detailed account of the species description, life history, population dynamics, threats, and conservation needs, refer to: https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=I0WI.

J.A. 1172. In internal email correspondence, FWS recognized that its discussion of the status of the RPBB was "[n]ot in lock step with the handbook" and "a different read than the usual multiple pages per species of species information." J.A. 711; *see* J.A. 1172.[5] Nonetheless, FWS defends its BiOp because the BiOp states that it "considered the current overall declining status of the RPBB and the inferred condition of the species within the action area (environmental baseline)," J.A. 1221; incorporates FWS's prior assessments of the status of the RPBB, J.A. 1172; and contains a detailed description of baseline conditions in the action area, J.A. 1181–86. Resp. Br. 26. FWS also asserts that an agency action "can only 'jeopardize' a species' existence if that agency action causes some deterioration in the species' pre-action condition." *Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv.*, 524 F.3d 917, 930 (9th Cir. 2008).

However, FWS ignores the corollary that "an agency may not take action that will tip a species from a state of precarious survival into a state of likely extinction." *Id.* That

[5] The author of that internal email expressed shock at the "brevity" of the 2018 BiOp's status discussion. J.A. 711 ("Wow, is that a different read."). And after acknowledging that the status section was not in accordance with the agency's handbook, the author added, "but we can get by that with my excessive wit, charm, and grace." *Id.* Wit, charm, and grace, however, do not make for sound agency action.

is, "even where baseline conditions already jeopardize a species, an agency may not take action that deepens the jeopardy by causing additional harm." *Id.* FWS's 2018 BiOp does not show that the agency considered the fact that, without any human interference, the RPBB already faces jeopardy. *See* J.A. 395 (June 2016 report explaining that RPBB "may lack the resiliency required to sustain populations into the future, even without further exposure to stressors"). Although the BiOp states that the agency considered the "current overall declining status of the RPBB," J.A. 1221, it omits any mention of the specifics of that declining status. The BiOp says nothing of the fact that the species has declined by nearly 90% in the past two decades. Nor does it mention that FWS determined, only a year earlier, that the species is "so imperiled that every remaining population is important for its continued existence." J.A. 941. Nor does it mention that FWS and agency scientists have previously determined that the RPBB is "very much declining," J.A. 764, is "vulnerable to extinction even without further external stressors (*e.g.*, habitat loss, insecticide exposure) acting upon the species," J.A. 498, and is at "a high risk of extinction," J.A. 507, 655.

To the contrary, many of the assumptions that FWS makes about the RPBB suggest that the agency considered the Bath County population as a healthy population. *See* J.A. 1184 (assuming 30 new foundress queens produced per colony per cycle); J.A. 1185 (relying on nest density of "common and abundant" buff-tailed bumble bee to determine RPBB nest density); J.A. 1215 (estimating that RPBBs in high potential zone will produce total of 660 queens each cycle). The 2018 BiOp's failure to account for the species's

already precarious state further renders its no-jeopardy determination arbitrary and subject to vacatur.

4. RPBB Recovery

Petitioners' final argument related to the BiOp's no-jeopardy finding for the RPBB is that FWS considered only the pipeline's effects on RPBB survival and ignored the effects on RPBB recovery.

A jeopardy evaluation must determine whether a proposed action "reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of *both the survival and recovery* of a listed species." 50 C.F.R. § 402.02 (emphasis added). FWS has defined "recovery" as "improvement in the status of a listed species to the point at which listing is no longer appropriate." J.A. 81. That is, "recovery is the process by which species' ecosystems are restored and/or threats to the species are removed so self-sustaining and self-regulating populations of listed species can be supported as persistent members of native biotic communities." *Id.*

"[I]t is hard to 'draw clear-cut distinctions' between survival and recovery." *Cooling Water Intake Structure Coalition v. EPA*, 905 F.3d 49, 76 (2d Cir. 2018) (quoting 51 Fed. Reg. 19,926, 19,934 (June 3, 1986)); *Nat'l Wildlife Fed'n*, 524 F.3d at 932 n.11. And when evaluating a programmatic-level BiOp, other courts have not required "an independent analysis of recovery." *Cooling Water*, 905 F.3d at 76. Nonetheless, our sister circuits have held that, in the context of "site-specific" BiOps like the BiOp at issue in this case, recovery impacts, "like survival impacts, should be assessed." *Id.*; *see also Nat'l Wildlife Fed'n*, 524 F.3d at 932 (determining that agency acted arbitrarily when it failed to

"analyze effects on recovery as well as effects on survival" in site-specific BiOp). We agree with those courts. Under the plain language of its own regulations, FWS is required to assess "both the survival *and* recovery of a listed species." 50 C.F.R. § 402.02 (emphasis added). The agency is not permitted to resolve the difficulty of distinguishing between survival and recovery "by ignoring recovery needs and focusing entirely on survival." *Nat'l Wildlife Fed'n*, 524 F.3d at 932 n.11.

Here, the 2018 BiOp makes no mention of the ACP's impacts on RPBB recovery. The BiOp explains the reasons for reproduction rate decline in the species and the likely impact of pipeline construction on that decline. *See* J.A. 1215–16. It says nothing, however, about recovery, nor does it explain why the no-jeopardy conclusion is reasonable given the acknowledged mortality, injury, and reduced reproduction that pipeline construction will cause to the RPBB—effects that FWS's Recovery Outline for the RPBB seeks to avoid. U.S. Fish and Wildlife Serv., *Recovery Outline*, at 7 (Sept. 5, 2018) [hereinafter *Recovery Outline*].[6] While a separate and distinct section analyzing the pipeline's impact on RPBB recovery was not necessary, FWS was required to address the

[6] The Endangered Species Act requires the Secretary of the Interior to "develop and implement plans . . . for the conservation and survival of endangered species and threatened species . . . , unless he finds that such a plan will not promote the conservation of the species." 16 U.S.C. § 1533(f)(1). Because the RPBB was listed as an endangered species in January 2017, a recovery plan has not yet been developed for the species. Resp. Br. 28. FWS, however, has prepared a Recovery Outline for the RPBB. The Recovery Outline, available on FWS's website, is cited in the 2018 BiOp as a source of additional information about the status of the RPBB. J.A. 1172. The Recovery Outline includes an Interim Recovery Program, which provides that "[i]mpacts to [RPBB] to avoid are those that may (1) result in mortality or injury to rusty patched bumble bee; (2) reduce reproduction or recruitment of young into populations; (3) increase stress to remaining individuals in the wild; or (4) alter habitat such that survival or reproduction is reduced." Recovery Outline at 7.

impacts of pipeline construction on the species' recovery. *See Rock Creek Alliance v. U.S. Fish and Wildlife Serv.*, 663 F.3d 439, 443 (9th Cir. 2011) (upholding BiOp when it failed to "address the bull trout recovery issue in separate, distinct sections" but nonetheless discussed "the rate of recovery" of the species throughout the BiOp). Because the agency "entirely failed to consider an important aspect of the problem," *Sierra Club*, 899 F.3d at 293, the omission of any discussion of the impact on the species's recovery constitutes yet another ground on which we find the 2018 BiOp's no-jeopardy determination arbitrary.

* * *

In sum, the 2018 BiOp's conclusion that the ACP will not jeopardize the RPBB in Bath County, Virginia, is arbitrary and capricious because it runs counter to available evidence, relies on data without providing a meaningful basis for that reliance, fails to consider the species's status as a whole, and fails to consider the pipeline's impacts on RPBB recovery. *See Defs. of Wildlife*, 762 F.3d at 396.

B. Clubshell

Turning to the 2018 BiOp's evaluation of pipeline impacts on the clubshell, we find that FWS arbitrarily concluded that the ACP will not jeopardize the continued existence of this species.

The clubshell, a freshwater mussel, lives in "clean, stable, coarse sand and gravel runs" in rivers and streams. J.A. 138. It typically burrows entirely beneath the riverbed to a depth of 2 to 4 inches. In fact, more than 70% of a stream's clubshell population "may be hidden below the substrate surface." *Id.* Because of this, FWS has explained that "qualitative population estimates must take into account undetected individuals" and has

warned that low density population estimates "may have large margins of error due to undetected mussels." J.A. 139.

When the waterway in which clubshell live undergoes a period of heavy sedimentation, the clubshell close their valves to avoid irritation and clogging of their feeding structures. If excessive sediment remains suspended in the waterway, the clubshell's gills may become overwhelmed, leading the clubshell to reduce its intake of food and water, or to completely close altogether. Clubshell also rely on oxygen that is dissolved in the water that percolates through the riverbed. Excessive sedimentation reduces the level of oxygen that is dissolved in the water and can block water from percolating through the streambed, causing resident clubshell to suffocate.

The clubshell was listed as an endangered species in 1993. There remain only 13 known populations of clubshell occupying 21 streams. The clubshell's numbers total more than 1 million, but a majority of that population lives in 1 river, and only 7 of the 13 populations show evidence of reproductive success.

In West Virginia, the clubshell occupies three streams: the Monongahela, Kanawha, and Ohio Rivers. The Monongahela River's sole remaining clubshell population lives in Hackers Creek. The West Virginia Division of Natural Resources ("WVDNR") has monitored the Hackers Creek population on a long-term basis, conducting monitoring surveys every 5 years. In 2004, a total of 38 clubshell were observed at the monitoring site. J.A. 1179. An additional 18 clubshell found further downstream were relocated to the monitoring site because the monitoring site was safer. This brought the total number of clubshell at the monitoring site to 56. In 2009, only 29 clubshell were observed at the

monitoring site. And in 2014, 19 were documented. *Id.* During those surveys, no juvenile or "gravid" (pregnant) clubshell were observed.

WVDNR and FWS have had "long-standing concerns about the status of the Hackers Creek population." J.A. 1011. The two agencies began meeting in early 2017 to discuss necessary recovery actions for the creek. As a product of those discussions, FWS issued a recovery permit under section 10(a)(1) of the ESA to White Sulphur Springs National Fish Hatchery.[7] That permit allowed White Sulphur Springs to collect, hold, and propagate clubshell from Hackers Creek "to address ongoing declines in the population and prevent loss of the population's genetic material." J.A. 1179. It is unclear from the record whether, and to what extent, White Sulphur Springs has engaged in such recovery work.

As currently projected, 6.4 miles of pipeline construction right-of-way and 11.9 miles of access roads will exist in the upstream drainage area of Hackers Creek. J.A. 1180. Six tributaries of Hackers Creek will also be crossed by the pipeline. ACP construction will therefore affect the "entire length" of Hackers Creek. J.A. 1199. It will lead to increased sedimentation and turbidity in the creek, which will lead in turn to impaired feeding for the clubshell population there. FWS expects this to result in depressed rates of growth, reproduction, and recruitment as Hackers Creek clubshell experience reduced physiological function, suffocation, and even death. ACP construction also may

[7] Section 10(a)(1) of the ESA provides in relevant part that "[t]he Secretary may permit, under such terms and conditions as he shall prescribe . . . any act otherwise prohibited by section 1538 of this title for scientific purposes or to enhance the propagation or survival of the affected species." 16 U.S.C. § 1539(a)(1)(A).

"permanently alter and degrade" the Hackers Creek habitat to the point where it will no longer be "favorable" for clubshell. *Id.*

Because of the extent of these effects to Hackers Creek, FWS's 2017 BiOp required Atlantic to salvage and relocate clubshell prior to pipeline construction. In April 2018, Atlantic obtained a section 10(a)(1) permit to salvage the population. The approved salvage plan provided that the Hackers Creek clubshell population would be captured and transported to White Sulphur Springs, where the clubshell would be "held and propagated" for a 2-year period before reintroduction into the Monongahela River. J.A. 1180. Three independent salvage efforts were scheduled to take place. The first two were conducted in May and July 2018, during which 56 live clubshell and 12 live clubshell were collected, respectively. The third salvage effort has not yet been conducted.

Two months after the salvage efforts, FWS issued its 2018 BiOp, concluding that pipeline construction will not jeopardize the clubshell species. In discussing the baseline conditions in Hackers Creek, the 2018 BiOp explains that the creek currently suffers from a high sediment load due to agricultural practices, oil and gas activities, and river bank instability. Despite the current sedimentation that threatens the Hackers Creek clubshell, FWS concluded that the additional sedimentation from the proposed pipeline will both affect those clubshell that are not salvaged and "degrade/alter clubshell habitat." J.A. 1199. Even though strong water flows, such as those caused by storms, are expected to flush "some" of the additional sediment downstream of the clubshell population, "the quality of the habitat will have decreased due to sediment remaining within interstitial spaces in the

substrate." J.A. 1200. Therefore, as a result of ACP construction, the Hackers Creek population is expected to "remain below pre-construction numbers." J.A. 1214.

Notwithstanding these effects, FWS concluded that adverse impacts to the entirety of the Hackers Creek population will not prevent FWS from meeting the Recovery Criteria for the species as a whole because the Hackers Creek population shows no "evidence of reproductive success." J.A. 1214. The Recovery Criteria for the clubshell require that viable clubshell populations be established in 10 separate drainages. "Viable" populations are those that "consist[ ] of sufficient numbers of reproducing individuals to maintain a stable or increasing population." J.A. 38. Eight recovery drainages (rivers) have been designated, and the other two have yet to be designated. The 2018 BiOp concluded that the Hackers Creek population was unlikely to be designated as one of the additional two drainages because its population is not reproducing. And, according to the 2018 BiOp, the fact that 68 clubshell were salvaged in 2018 while only 19 were documented in 2014 did not mean that the Hackers Creek population had increased; "the level of effort and survey area for the salvage effort differs from that of the long-term monitoring efforts," thus "the results are not comparable." J.A. 1180.

There are several flaws with the reasoning behind FWS's no-jeopardy conclusion. First, the premise that only those members of an endangered species that can naturally contribute to the species's recovery should be protected is unsupported by legal authority. The Ninth Circuit has held that "except in exceptional circumstances, [a project's] injury to recovery alone would not warrant [a jeopardy finding]." *Nat'l Wildlife Fed'n*, 524 F.3d at 932 (second alteration in original) (quoting 51 Fed. Reg. at 19,934). However, FWS

points to no legal authority to support the inverse of that holding—that a lack of injury to recovery alone warrants a no-jeopardy finding. While "they are not necessarily mutually exclusive, recovery and jeopardy are two distinct concepts." *Cascadia Wildlands v. Thrailkill*, 806 F.3d 1234, 1244 (9th Cir. 2015). Additionally, as we explained earlier, the ESA requires that FWS determine whether a proposed action "reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of *both the survival and recovery* of a listed species." 50 C.F.R. § 402.02 (emphasis added). Like jeopardy and recovery, the concepts of survival and recovery are also distinct and must each be evaluated.

To be sure, the ESA is aimed at promoting self-sustaining populations. *See Trout Unlimited v. Lohn*, 559 F.3d 946, 957 (9th Cir. 2009); H.R. Rep. No. 95–1625 (1978), at 5, *reprinted in* 1978 U.S.C.C.A.N. 9453, 9455. However, the ESA is not focused exclusively on protecting those populations that currently are naturally reproductive; it contemplates that artificial propagation may be necessary to "bring any endangered species or threatened species to the point at which the measures provided pursuant to [the ESA] are no longer necessary." 16 U.S.C. § 1532(3). Therefore, a determination that a population's current nonreproductive status is sufficient grounds to conclude that a listed species will not be jeopardized is not in line with the law.

Indeed, FWS's own regulations suggest that a specific population's impact on the species's recovery is not dispositive of a jeopardy analysis. Those regulations provide that a proposed action jeopardizes the species at issue if it is likely to reduce "the reproduction, *numbers, or distribution* of that species." 50 C.F.R. § 402.02 (emphasis added). The

ability to reproduce is only one of three things that FWS considers. And the 2018 BiOp indicates that pipeline construction will reduce clubshell numbers. The anticipated changes in habitat, "resulting in sublethal effects on growth and reproduction or starvation with long-term exposure," will affect "*a majority of* individual mussels," and the Hackers Creek population will remain "below pre-construction numbers" even after higher river flows clear away some of the additional sedimentation from the pipeline. J.A. 1213–14 (emphasis added). The BiOp does not explain why the reduction in numbers itself poses no jeopardy to the species.

A second problem with the 2018 BiOp's no-jeopardy determination is that its sole focus on reproduction does not accord with FWS's own Recovery Criteria for the clubshell. The designation of recovery drainages in the Recovery Criteria did not depend on the natural reproductive abilities of the clubshell located in those rivers. At the time the Recovery Criteria were issued in 1994, FWS's Recovery Plan indicated that it was unknown if the population in Green River (one of the designated drainages) was reproducing. J.A. 24. The Recovery Plan also indicated that "many individuals" in the East Fork West Branch of the St. Joseph River (another designated drainage) were adults "in excess of 12 years old." *Id.* And "[m]ore research" was needed to determine the status of the clubshell population in Elk River (another designated drainage). *Id.* In FWS's 2008 clubshell review, the agency noted that reproducing populations of clubshell had been documented in 7 of the 8 listed waterways; Fish Creek did not show evidence of reproduction, yet it continues to be a designated drainage crucial for the species recovery.

J.A. 137–38.[8] The 2018 BiOp fails to explain why those populations, with no documented natural reproduction, were nonetheless designated as crucial to the recovery of the clubshell but the Hackers Creek population would not be.

Perhaps more troubling, however, is that the Recovery Criteria were issued in 1994, 25 years ago, and by FWS's own admission, the "recovery plan . . . is out of date." J.A. 135. FWS's 2008 5-year review of the clubshell noted that the agency could not rely on data in the outdated recovery plan and, therefore, relied on data provided by other sources. *Id.* That 5-year review also acknowledged that the Recovery Criteria "are vague" in that, among other things, "[p]opulation viability is not defined" and population and habitat protection are "not well-defined." J.A. 138. Yet, FWS continues to rely on the 25-year-old Recovery Criteria, based on concededly outdated data, and relied on that Criteria and the 1993 data underlying the Criteria in its no-jeopardy determination here. *See* J.A. 1181 (citing to 1993 survey data as evidence of clubshell's likely presence in upstream area); J.A. 1214 (relying on 1994 Recovery Criteria in determining that ACP construction will not jeopardize the Hackers Creek clubshell).

The agency's reliance on out-of-date information also calls into question the reasonableness of FWS's estimate of the number of clubshell present in Hackers Creek and likely to be impacted by the ACP. It is true that FWS updated its estimate of the area occupied by the Hackers Creek clubshell based on data gathered during the 2018 salvage efforts. And yet, it continues to rely on the 1993 survey data to conclude that clubshell are

[8] When Fisk Creek was designated as a recovery drainage in 1994, even "[l]iving" clubshell in the creek were "rare." J.A. 24. Yet, that creek was deemed necessary to achieve recovery of the species.

not likely to be present further upstream. J.A. 1181. The BiOp reaches this conclusion while acknowledging that the habitat "improves upstream" of the salvage area and without explaining why the 1993 survey data is still reliable. *Id.* This is particularly problematic because the 1993 survey data indicated that "no mussels of any species were found in the upstream area," but in more recent conversations with WVDNR about the upstream habitat, FWS was simply informed that the upstream beds were less diverse—not that they were non-existent, as the 1993 survey found. *Id.* The 2018 BiOp fails to explain why the 1993 survey remains the best available information on which to base estimates of the location of the clubshell population.[9]

Nor does the 2018 BiOp sufficiently explain the discrepancies between the number of clubshell observed during the 5-year monitoring surveys and the number recovered during the 2018 salvage efforts. The BiOp notes that the "level of effort and survey area for the salvage effort differs from that of the long-term monitoring efforts," J.A. 1180, but fails to elaborate. The BiOp provides no information regarding the manner in which either the monitoring surveys or the salvage efforts were conducted. While the higher number of clubshell recovered during the salvage efforts is not necessarily indicative of reproductive success, as Petitioners argue, the higher number—more than triple that of the most recent monitoring survey—does cause us to question whether the monitoring surveys are the best available information regarding the Hackers Creek population. This is particularly the case

[9] As a result of the salvage effort, FWS expanded the zone in which it believes clubshell to exist to 7.6 kilometers upstream, which is approximately 4.72 miles. J.A. 1181. A 2015 survey of the area 3.2 miles upstream had revealed no clubshell. J.A. 1179. Therefore, the salvage effort uncovered clubshell in that upstream area that previously had not been documented.

because, by its nature, the clubshell is difficult to detect: 70% of a clubshell population may be burrowed; "[r]eproducing clubshell populations are often hard to detect when densities are very low or surveys are single-day, catch-per-unit efforts"; "sparsely distributed juveniles used to document successful reproduction are likely even more difficult to detect"; and clubshell are less susceptible to capture at times outside of their gravid period. J.A. 139 (2008 clubshell review); J.A. 931.

In light of the apparent conflicts of more recent information with the 1993 survey, the much higher number of clubshell detected in 2018 than in previous surveys, and FWS's own admission that the recovery plan on which it relies is outdated, FWS was required to "at the very least, . . . explain why it nevertheless chose to rely on the older data." *Dow AgroSciences LLC*, 707 F.3d at 473. As a reviewing court, "we should not silently rubber stamp agency action that is arbitrary and capricious in its reliance on old data without meaningful comment on the significance of more current compiled data." *Id.* (quoting *Sierra Club v. EPA*, 671 F.3d 955, 968 (9th Cir. 2012)).

For the above reasons, we conclude that the 2018 BiOp's finding that the clubshell's continued survival will not be jeopardized by ACP construction is not in accordance with the law and fails to consider important aspects of the issue before the agency. *Alaska Dep't of Envtl. Conservation*, 540 U.S. at 496–97; *Defs. of Wildlife*, 762 F.3d at 396.

C. Indiana Bat

Petitioners also challenge FWS's take limit for the Ibat. For the reasons that follow, we agree that the take limit fails to satisfy the criteria for a proper surrogate habitat.

The Ibat is an endangered migratory bat. *Sierra Club*, 899 F.3d at 278. Between 2015 and 2017, the number of Ibats in Virginia and West Virginia declined. In Virginia, the population declined 8.4%, and only 425 Ibats were estimated to live in the state in 2017. In West Virginia, the decline was more severe: the population decreased by 54.7% to a total of 1,076 Ibats. J.A. 1189.

The ACP action area will cross through the Indiana Bat Appalachian Mountain Recovery Unit in both states. Four categories of Ibat habitat will be crossed: (1) suitable unoccupied summer habitat, suitable for Ibat occupation but in which Ibats have not been detected during the summer; (2) known use summer habitat, which includes roosting trees and is likely to contain a maternity colony of bats; (3) unknown use spring staging/fall swarming habitat, which is unsurveyed habitat within 5 miles of habitat suitable for winter hibernation ("hibernacula"); and (4) known use spring staging/fall swarming habitat, which is habitat within a 5-mile radius of known hibernacula. At issue in this appeal is the pipeline's effect on Ibats in the first category of habitat, the suitable unoccupied summer habitat.

When FWS issued its 2017 BiOp, a majority of the scheduled surveys for Ibat presence had been completed. While 4 surveys were pending in Virginia at the time, other follow-up surveys in Virginia had been conducted and surveys in West Virginia were complete. The completed surveys were negative for Ibat presence in the unoccupied summer habitat. J.A. 843.[10] Yet, as the 2017 BiOp explained, FWS anticipated that tree

[10] Ibats were acoustically detected at 17 sites along the proposed pipeline route, but follow-up mist-net surveys did not capture any Ibats. J.A. 843, 1190.

clearing on 3,275 acres of suitable unoccupied summer habitat would indirectly impact the Ibat, particularly those Ibats "searching for potential roosting sites and those traveling through the area." J.A. 854. This is because Ibats do not travel through zones that do not have tree cover and would, therefore, not travel through unoccupied summer habitat once that habitat was cleared. FWS anticipated that the greatest effects of tree clearing in this habitat would be felt by the "pregnant females that expend additional energy to seek alternate travel corridors as a result of tree clearing." *Id.* As a result of the expended energy to seek alternative travel routes, pregnant Ibats could give birth to smaller pups, "which could decrease pup survival." *Id.*

In its 2017 ITS, which we vacated, FWS relied entirely on a habitat surrogate, after it improperly failed to explain why using a numeric take limit was impractical. *Sierra Club*, 899 F.3d at 279–80. Rather than use a numeric limit, the agency used a multiplier to determine that Atlantic could take half of the total suitable unoccupied summer habitat. *Id.*[11] FWS did not explain the basis for that multiplier. We determined that this take limit lacked, among other things, a proper causal link between the Ibat and the "geographic bounds of the take limit." *Id.* at 278–80. As we explained, "FWS knew that the pipeline will directly affect 3,275.382 acres of suitable unoccupied summer habitat . . . [y]et, without any explanation, the agency set the take limit for [this habitat] at half of the[ ] acreage[ ]. In other words, FWS set the take limit at half the affected bat habitat that it knows the pipeline is going to affect." *Id.* at 279. Because FWS knew that the pipeline

[11] The 2017 ITS also set take limits for the other three categories of Ibat habitat that would be impacted by pipeline construction. *See Sierra Club*, 899 F.3d at 279. The take limits of those other three categories of Ibat habitat are not at issue in this appeal.

would exceed the geographic bounds placed on the take, the take limit was arbitrary. *Id.* at 280.

In an apparent attempt to correct the mistakes that we identified with the 2017 ITS, FWS has now set both a numeric take limit (2 Ibats) as well as an acreage limit (as a habitat surrogate). As the 2018 BiOp explains, "there are challenges associated with measuring take in terms of individuals." J.A. 1230. Thus, FWS chose to use both limits, such that a taking of more than 2 Ibats or more than the acreage limit will constitute an unlawful taking.

Petitioners do not challenge the numeric take limit. Rather, they challenge the habitat surrogate. An ITS must "[s]pecif[y] the impact, i.e., the amount or extent, of such incidental taking on the species." 50 C.F.R. § 402.14(i)(1)(i). Once FWS has established the amount of the take in the ITS, a project proponent may not lawfully take any members of the listed species above and beyond that amount without further authorization from the agency. Although numeric take limits are preferred, FWS may instead employ a habitat surrogate to establish a take limit when setting a numeric take limit is impractical. *Id.* For a habitat surrogate to be proper, FWS regulations require three elements: (1) "FWS must include a description of 'the causal link between the surrogate and take of the listed species'"; (2) "FWS must explain 'why it is not practical to express the amount or extent of anticipated take or to monitor take-related impacts in terms of individuals of the listed species'"; and (3) "FWS must set 'a clear standard for determining when the level of anticipated take has been exceeded.'" *Sierra Club*, 899 F.3d at 271 (quoting 50 C.F.R. § 402.14(i)(1)(i)).

FWS abandoned the use of multipliers in establishing a habitat surrogate in its 2018 ITS. Instead, the agency entirely eliminated the 3,275 acres of unoccupied summer habitat from the habitat surrogate, which now consists only of:

- 137.5 acres of known use summer habitat in West Virginia;
- 178.1 acres of unknown use spring staging/fall swarming habitat in West Virginia; and
- 703.0 acres of known use spring staging/fall swarming habitat, which consists of 283 acres in Virginia and 420 acres in West Virginia.

J.A. 1232.

Explaining the absence of suitable unoccupied summer habitat from its calculus, FWS now takes the position that "[r]emoving large areas of trees when Ibat surveys were negative, i.e., in unoccupied summer habitat, is presumed not to result in indirect effects to Ibats because survey results indicate they are not currently occupying the area." J.A. 1190. As FWS explains, "negative survey results are considered probable absence for Ibats and the correct determination for project effects in these instances is 'not likely to adversely affect' the Ibat regardless of the amount of acres being cleared. This interpretation of Ibat negative survey results is used by other field offices and regions of [FWS]." *Id.* Whereas the 2017 BiOp indicated that a "majority" of the impacts to Ibats would be caused by the clearing of the suitable unoccupied summer habitat, J.A. 920, the 2018 BiOp concludes that no adverse impacts will result.

The 2018 BiOp offers no cogent explanation for this about-face. It makes no mention of the 2017 BiOp's findings that clearing this habitat will have several anticipated indirect impacts, including the expenditure of additional travel energy by pregnant females,

which could lead to decreased pup survival, and increased risk of predation, leading to injury or death. J.A. 920. Instead, it relies on the fact that completed Ibat surveys were negative for Ibat presence in the unoccupied summer habitat; because those surveys were negative, the BiOp "presume[s]" that clearing trees in that habitat will not "result in indirect effects to Ibats." J.A. 1190. But a majority of those surveys had been completed at the time the 2017 BiOp and ITS were issued. Therefore, the conclusions of the 2017 BiOp were made with the benefit of most of the surveys, surveys that showed no Ibat presence at the time. The 4 Virginia surveys that had not been completed at the time have produced no new evidence; the completed surveys merely confirmed what FWS already knew in 2017—that Ibats were not detected in the unoccupied summer habitat. Thus, the newly completed surveys do not explain the complete change in position that FWS now takes.

The 2018 BiOp's reliance on the practices of other field offices does not rescue its arbitrary change in view. The BiOp states that the agency's new position—that negative Ibat surveys support a presumption of no indirect effects to Ibats in the unoccupied habitat— is in line with that taken by other unnamed field offices of the agency. However, *this* particular field office already determined that, for *this* particular project, clearing over 3,000 acres of suitable unoccupied summer habitat will cause "the majority of effects to Ibats from tree clearing." J.A. 920 (2017 BiOp). The 2018 BiOp and ITS fail to explain why the practice of other field offices is now dispositive and renders this field office's previous findings erroneous.

Moreover, the 2018 BiOp's conclusion is in conflict with the evidence before the agency. As FWS notes in the BiOp, two of the "primary factors" that influence the Ibat's

status are "habitat loss and degradation" and "forest fragmentation." J.A. 1172. In light of those known primary threats to the Ibat, it takes little more than common sense to deem arbitrary FWS's conclusion that clearing unoccupied yet suitable forest habitat, "regardless of the amount of acres being cleared," J.A. 1190, will have no impacts on the species.

While FWS is "entitled to change its view[,] . . . it is obligated to explain its reasons for doing so." *State Farm*, 463 U.S. at 56. Because FWS has abandoned without a cogent explanation its earlier determination that clearing thousands of acres of suitable unoccupied summer Ibat habitat will indirectly impact the Ibat and ignores evidence of what the agency previously considered a substantial cause of take, the 2018 ITS fails to articulate a "causal link between the surrogate and take" of the Ibat. 50 C.F.R. § 402.14(i)(1)(i); *see Sierra Club*, 899 F.3d at 271 ("A 'causal link' is an 'articulated, rational connection' between the activity and the taking of the species." (quoting *Ariz. Cattle Growers' Ass'n v. U.S. Fish and Wildlife, Bureau of Land Mgmt.*, 273 F.3d 1229, 1250–51 (9th Cir. 2001))). And because FWS acknowledges that a numeric take limit will not sufficiently account for the incidental taking of Ibats, the 2018 ITS fails to establish a "clear standard for determining when the level of anticipated take has been exceeded." 50 C.F.R. § 402.14(i)(1)(i). Thus, FWS has improperly failed to specify the impact of such incidental taking on the Ibat. *Id.*

D. Madison Cave Isopod

Petitioners' final challenge to FWS's 2018 action is to the take limits imposed for the MCI. The MCI is "a threatened subterranean freshwater crustacean about a half-inch in size." *Sierra Club*, 899 F.3d at 277. The MCI lives in underground phreatic karst waters

in the Shenandoah Valley in Virginia. It was listed as a threatened species in November 1982.

According to both the 2017 and 2018 BiOps, ACP construction rights-of-way, additional temporary work space, and access roads will impact 25 miles of MCI potential habitat. Pipeline construction will crush or smother these crustaceans. Construction will also lead to a temporary reduction in feeding or reproduction and will cause sediment to enter the subsurface habitat, rendering that habitat temporarily or permanently unsuitable for MCI use.

Because of the MCI's small size, subterranean habitat, and a lack of effective survey protocols, FWS cannot practically estimate the number of MCI that may be taken by ACP construction. Therefore, FWS relies on a habitat surrogate to establish take limits. We previously concluded that the agency's reliance on a habitat surrogate is proper because "FWS has shown that a numeric take limit is not practical here." *Sierra Club*, 899 F.3d at 278. At issue, however, is the soundness of that habitat surrogate. Reviewing the 2018 habitat surrogate, we conclude that FWS again has established an arbitrary take limit for this species.

A comparison of the agency's 2017 and 2018 decisions is helpful. The 2017 BiOp found that a total of 1,974 acres of potential MCI habitat in Augusta County, Virginia, will be affected by ACP construction. Although there have been no documented MCI "localities" in the proposed construction right-of-way or additional temporary workspace, FWS assumed MCI presence at Cochran's Cave in Augusta County. J.A. 865. That cave bisects the construction right-of-way and temporary workspace across 11.2 acres. That

11.2-acre area will be displaced during pipeline construction. Due to the karst terrain, FWS determined that the ground-disturbing activities within this 11.2-acre zone will have ripple effects extending out half a mile, such that MCI will be taken in a total of 896.7 acres. According to the 2017 ITS, pipeline construction will kill a "[s]mall percent of" MCI in the 11.2-acre area and harm or harass "[a]ll individuals present within the 896.7 acres." J.A. 872–73. The ITS said nothing about take of MCI within the remainder of the 1,974 acres of MCI habitat impacted by the ACP.

Like the 2017 BiOp, the 2018 BiOp indicates that pipeline construction will impact a total of 1,974 acres of potential MCI habitat. J.A. 1228. The 2018 BiOp also assumes MCI presence at Cochran's Cave. J.A. 1188. The 2018 BiOp again explains that pipeline construction will displace 11.2 acres at Cochran's Cave and that construction materials and sediment released onto the surface or subsurface karst terrain due to the ground disturbing activities in that 11.2-acre zone may reach MCI up to half a mile away. Therefore, FWS anticipates that pipeline construction will impact MCI in the 11.2 acres as well as across an additional 885.5 acres (the 896.7-acre zone used as a habitat surrogate in the 2017 ITS). *Id.*

This time, however, FWS has chosen to use as a habitat surrogate only the 11.2 acres that will be directly displaced by construction. The 2018 ITS explains that only the 11.2 acres are used as a habitat surrogate "because that is the area that [FWS] can actually measure and monitor." J.A. 1228. The BiOp elaborates on the take limit; it explains that the effects on the MCI that are anticipated in the additional 885.5 acres are the result of ground-disturbing activities performed within the 11.2-acre zone, and a habitat surrogate

of ground-disturbing activities within that 11.2-acre zone will therefore account for the take of MCI within the entire 896.7-acre area. J.A. 1202. Like its predecessor, the 2018 BiOp and ITS say nothing of the potential take of MCI within the remainder of the 1,974 acres of potential species habitat.

In our review of the 2017 ITS, we concluded that FWS arbitrarily limited the habitat surrogate to the 896.7 acres near Cochran's Cave. *Sierra Club*, 899 F.3d at 278. Because FWS provided no explanation for limiting the habitat surrogate to the 896.7-acre zone when the agency found that a total of 1,974 acres of potential MCI habitat would be impacted by the pipeline, FWS failed to establish a proper "causal link between the isopod and the geographic bounds of the take limit." *Sierra Club*, 899 F.3d at 278.[12]

In the 2018 ITS, FWS commits the same error that we identified in our previous opinion. The ITS provides no explanation for its failure to account for potential take of MCI in the remainder of the 1,974 acres of MCI habitat impacted by pipeline construction. And while the 2018 BiOp explains that FWS does "not anticipate impacts to MCI in the remainder of the 1,974 surface acres" for two reasons, neither of those reasons is availing.

First, FWS asserts that there will be no impacts to MCI outside of the 896.7-acre area due to the avoidance and minimization measures ("AMMs") put in place by FERC. J.A. 1188. Yet, the 2018 BiOp acknowledges that the AMMs "will not be completely

[12] We also found that the take limit failed to provide a clear standard for enforcement because it limited take to a "small percent of" MCI within the 11.2-acrea area. Sierra Club, 899 F.3d at 278. The 2018 ITS does not make the same mistake of using vague language to define the take limit, and Petitioners do not argue that the current take limit fails to establish a "clear standard." 50 C.F.R. § 402.14(i)(1)(i). Rather, Petitioners challenge the 2018 BiOp and ITS's conclusion that no MCI take is anticipated in the remainder of the 1,974 acres of potential MCI habitat.

effective in preventing all sediment from entering the phreatic water" in which the MCI live and that AMMs "cannot completely prevent shifts in surface and sub-surface formations and hydrology from trenching, digging, or blasting." J.A. 1217. "Sudden shifts in subterranean structures are likely to crush or trap MCIs, alter their travel corridors, or isolate portions of the population." J.A. 1217–18. Therefore, even with the AMMs in place, FWS "anticipate[s] a reduction in the fitness of this undocumented population." J.A. 1218.

Second, FWS asserts in the BiOp that there will be no impacts to MCI outside of the 896.7 acres because of the depth of the water that the MCI inhabit. J.A. 1188. Specifically, the depth to groundwater in Augusta County, where MCI live, is approximately 20 feet below the surface, and pipeline construction will disturb only 6 to 8 feet below the surface. *Id.* Therefore, FWS concludes that pipeline construction is "not expected to pose a significant risk to groundwater." *Id.* However, nothing in the 2018 BiOp states that impacts to the MCI will occur only where construction occurs within the groundwater table. Rather, the BiOp makes clear that blasting and trenching through karst terrain will injure and kill MCI at a distance by causing the crumbling of geologic formations. J.A. 1202, 1217. While FWS took this into account in assessing the MCI likely to be taken by construction of the right-of-way in the 11.2 acres near Cochran's Cave, the agency fails to explain why construction activities that impact the remaining 1,974 acres will not have the same effects. If ground disturbing activities will cause the horizontal crumbling of the karst terrain hundreds of acres away, it is "implausible" to expect that the same activities will not impact the terrain a mere 12 vertical feet below. *See*

Defs. of Wildlife, 762 F.3d at 396 (explaining that agency action is arbitrary if it is "so implausible that it could not be ascribed to a difference in view or the product of agency expertise").

The arbitrary nature of FWS's choice to ignore the remainder of the potential MCI habitat in formulating its habitat surrogate is highlighted by other evidence in the record regarding the relevant terrain. There is evidence of sinkholes and sinking streams located outside of the 11.2-acre Cochran Cave area (and outside of the 885.5-acre zone affected by ground disturbing activities at the cave) but within the remainder of the 1,974 acres of potential MCI habitat. *See* J.A. 630 (listing sinkholes A096-8, A105-1, and A132-2 as high-risk sinkholes in areas where MCI presence is assumed). As the Final Environmental Impact Statement explains, these sinkholes pose a concern because "water and sediment movement from construction activities may transfer to subterranean habitats occupied by [MCI], altering habitats used by the species." J.A. 632. This could lead to the death of MCI or degradation of MCI habitats to the point where they are rendered unusable. *Id.* And "because of the interconnected network of karst features, actions in one area can produce impacts considerable distances from the actual point of activity." *Id.* The 2018 BiOp and ITS do not address the sinkhole evidence or plausibly explain why MCI in the remaining 1,974 acres of MCI habitat that contain open sinkholes will not be subject to take.

Based on the above, it appears likely that construction activities will result in the take of more MCI than set forth in the habitat surrogate of the 2018 ITS. FWS has again failed to establish a "causal link between the surrogate and take of the listed species."

Sierra Club, 899 F.3d at 271; 50 C.F.R. § 402.14(i)(1)(i). Therefore, the MCI take limit does not comply with the requirements of the ESA and is an unenforceable habitat surrogate.

V.

We cannot ignore that it took FWS a mere 19 days to issue the 2018 BiOp and ITS after FERC resumed formal consultation with the agency following our first decision in this matter. In fast-tracking its decisions, the agency appears to have lost sight of its mandate under the ESA: "to protect and conserve endangered and threatened species and their habitats." *Nat'l Ass'n of Home Builders*, 551 U.S. at 651. This mandate has "priority over the 'primary missions' of federal agencies." *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 185 (1978). We hope that, upon remand, FWS will consider any further action it takes with this mandate in mind.

For the foregoing reasons, FWS's 2018 BiOp and ITS arbitrarily conclude that ACP construction will not jeopardize the RPBB or the clubshell and fail to create enforceable take limits for the Ibat and MCI. Because FWS's decisions are arbitrary and capricious, we vacate the 2018 BiOp and ITS.

VACATED AND REMANDED